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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,054

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EXAMINER

HEINCER, LIAM J

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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/539,054	Applicant(s) YOKOYAMA ET AL.	
	Examiner Liam J. Heincer	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 7-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 22, 2009 has been entered.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (WO 99/11709) in view of Scardino et al. (US 2002/0032302) as evidenced by Kelsey et al. (US 2002/0009353).

Considering Claims 1 and 2: Kato et al. teaches a polytrimethylene terephthalate (1:5-14) resin with an intrinsic viscosity of 0.4 to 2 dl/g (abstract); a cyclic dimer content of less than 1% by weight (10:50-55) and a b value of 6.2 (Example 2). Kato et al. also teaches the resin as being made with a titanium catalyst (9:24-31) in the presence of a phosphate (6:11-30). As disclosed in the original specification (page 121) this will produce a resin with the desired E value of less than 0.033.

Kato et al. does not teach the devolatilization and viscosity increase as occurring during the melt phase. However, Scardino et al. teaches the removing cyclic dimers from the melt polycondensation phase at reduced pressure (§0012). Kato et al. and Scardino et al. are analogous art as they are concerned with a similar technical difficulty, namely removing cyclic dimers from a polytrimethylene terephthalate resin. It would have been obvious to a person having ordinary skill in the art at the time of invention to have removed the dimer in the melt phase as in Scardino et al. in the process of Kato et al., and the motivation to do so would have been, as Kelsey et al. suggests, to improve the dyeability of the resin (§0006).

The Office realizes that all of the claimed effects or physical properties are not positively stated by the reference(s). However, the reference(s) teaches all of the claimed ingredients and the same process as disclosed in instant claims. Therefore, the claimed effects and physical properties, i.e. the molecular weight distribution, L value, and crystallinity would implicitly be achieved by a composition with all the claimed ingredients. If it is the applicant's position that this would not be the case: (1) evidence would need to be provided to support the applicant's position; and (2) it would be the Office's position that the application contains inadequate disclosure that there is no teaching as to how to obtain the claimed properties with only the claimed ingredients.

Claims 3, 4, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (WO 99/11709) in view of Scardino et al. (US 2002/0032302) as evidenced by Kelsey et al. (US 2002/0009353).

Considering Claims 3, 4, and 7: Kato et al. teaches a method for producing a polytrimethylene terephthalate comprising providing a molten trimethylene

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terephthaltate resin that is made of 100% trimethylene terephthalate units (8:55-9:6) with a viscosity of up to 0.80 dL/g (10:34-37) with a specific example of 0.70 dL/g (example 2); and processing the resin at reduced pressure of less than 0.5 torr/0.06 kPa in the melt phase (8:55-9:6). Kato et al. also teaches the resin as being made with a tin catalyst (9:24-31) in the presence of a phosphate (6:11-30). As disclosed in the original specification (page 121) this will produce a resin with the desired E value of less than 0.033.

Kato et al. does not teach the devolatilization as occurring during the melt phase. However, Scardino et al. teaches the removing cyclic dimers from the melt polycondensation phase at reduced pressure (¶0012). Kato et al. and Scardino et al. are analogous art as they are concerned with a similar technical difficulty, namely removing cyclic dimers from a polytrimethylene terephthalate resin. It would have been obvious to a person having ordinary skill in the art at the time of invention to have removed the dimer in the melt phase as in Scardino et al. in the process of Kato et al., and the motivation to do so would have been, as Kelsey et al. suggests, to improve the dyeability of the resin (¶0006).

Considering Claim 8: Kato et al. teaches a tin catalyst as being used in the prior art (2:33-36). It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the tin catalyst of the prior art in the process of Kato et al., and the motivation to do so would have been, as Kato et al. suggests, the polymerization rate is higher when using tin catalysts than titanium catalysts (2:36-39).

Claims 9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (WO 99/11709) in view of Komiya et al. (US Pat. 6,265,526) and Scardino et al. (US 2002/0032302) as evidenced by Kelsey et al. (US 2002/0009353).

Considering Claims 9, 11, and 12: Kato et al. teaches a method for producing a polytrimethylene terephthalate comprising providing a molten trimethylene terephthaltate resin that is made of 100% trimethylene terephthalate units (8:55-9:6) with a viscosity of up to 0.80 dL/g (10:34-37) with a specific example of 0.70 dL/g (example 2); and processing the resin at reduced pressure of less than 0.5 torr/0.06 kPa

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in the melt phase (8:55-9:6). Kato et al. also teaches the resin as being made with a tin catalyst (9:24-31) in the presence of a phosphate (6:11-30). As disclosed in the original specification (page 121) this will produce a resin with the desired E value of less than 0.033.

Kato et al. does not teach the devolatilization as occurring during the melt phase. However, Scardino et al. teaches the removing cyclic dimers from the melt polycondensation phase at reduced pressure (¶0012). Incorporated reference Kelsey et al. teaches that the devolatilization will occur at reduced pressure at temperatures within the range of 250 and 270 °C (¶0019). Kato et al. and Scardino et al. are analogous art as they are concerned with a similar technical difficulty, namely removing cyclic dimers from a polytrimethylene terephthalate resin. It would have been obvious to a person having ordinary skill in the art at the time of invention to have removed the dimer in the melt phase as in Scardino et al. in the process of Kato et al., and the motivation to do so would have been, as Kelsey et al. suggests, to improve the dyeability of the resin (¶0006).

Kato et al. does not teach using a guide-wetting fall polymerizer. However, Komiya et al. teaches polymerizing aromatic polyesters in a guide-wetting polymerizer having a perforated plate and a guide (14:54-16:29). Kato et al. and Komiya et al. are analogous art as they are concerned with the same field of endeavor, namely aromatic polyester polycondensation polymerizations. It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the guide wetting fall polymerizer in the process of Kato et al. as in Komiya et al., and the motivation to do so would have been, as Komiya et al. suggests, to increase renewal of the surface of the molten prepolymer (12:30-42), thus allowing more cyclic dimer to reach the surface and thus be evaporated.

Considering Claim 13: Kato et al. teaches a tin catalyst as being used in the prior art (2:33-36). It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the tin catalyst of the prior art in the process of Kato et al., and the motivation to do so would have been, as Kato et al. suggests, the polymerization rate is higher when using tin catalysts than titanium catalysts (2:36-39).

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Considering Claim 14: Kato et al. teaches a cyclic dimer content below 1% by weight (10:50-55).

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. (WO 99/11709) in view of Scardino et al. (US 2002/0032302) as evidenced by Yoshima et al. (US Pat. 6,245,129) and Kelsey et al. (US 2002/0009353).

Considering Claims 10-12: Kato et al. teaches a method for producing a polytrimethylene terephthalate comprising providing a molten trimethylene terephthalate resin that is made of 100% trimethylene terephthalate units (8:55-9:6) with a viscosity of up to 0.80 dL/g (10:34-37) with a specific example of 0.70 dL/g (example 2); and processing the resin at reduced pressure of less than 0.5 torr/0.06 kPa in the melt phase (8:55-9:6). Kato et al. also teaches the resin as being made with a titanium catalyst (9:24-31) in the presence of a phosphate (6:11-30). As disclosed in the original specification (page 121) this will produce a resin with the desired E value of less than 0.033.

Kato et al. does not teach the devolatilization as occurring during the melt phase. However, Scardino et al. teaches the removing cyclic dimers from the melt polycondensation phase at reduced pressure (¶0012). Incorporated reference Kelsey et al. teaches that the devolatilization as occurring in a thin film evaporator at a pressure of 0.2 to 2.5 mbar/0.02-2.5 kPa (¶0019-20). Kato et al. and Scardino et al. are analogous art as they are concerned with a similar technical difficulty, namely removing cyclic dimers from a polytrimethylene terephthalate resin. It would have been obvious to a person having ordinary skill in the art at the time of invention to have removed the dimer in the melt phase as in Scardino et al. in the process of Kato et al., and the motivation to do so would have been, as Kelsey et al. suggests, to improve the dyeability of the resin (¶0006).

Kato et al. does not teach the claimed contact area during devolatilization. However, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP § 2144.05.

Yoshima et al. teaches that the contact area and amount of suspension affect the efficiency of the removal of small organic molecules through thin film evaporation (1:66-2:59). As such, a person having ordinary skill in the art at the time of invention would consider the contact area and amount of polymer to be result effective variables. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of invention to have optimized the contact area and polymer volume through routine optimization, and the motivation to do so would have been, to increase the efficiency of the dimer removal.

Considering Claim 13: Kato et al. teaches a tin catalyst as being used in the prior art (2:33-36). It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the tin catalyst of the prior art in the process of Kato et al., and the motivation to do so would have been, as Kato et al. suggests, the polymerization rate is higher when using tin catalysts than titanium catalysts (2:36-39).

Considering Claim 14: Kato et al. teaches a cyclic dimer content below 1% by weight (10:50-55).

Response to Arguments

Applicant's arguments filed March 23, 2009 have been fully considered but they are not persuasive, because:

A) Applicants argument that Scardino et al. does not teach high viscosity polymers is not persuasive. Scardino et al. teaches that viscosities of preferably 0.9 to 1.1 dl/g can be achieved by using a solid state step, or through an all melt process (¶0013-14). Therefore, both Kato et al. (10:34-59) and Scardino et al. (¶0013-14) teach that viscosity can be increased to amounts greater than 0.74 dl/g as claimed.

B) Applicants argument that the rejection requires using a solid-phase step is a mischaracterization of the rejection. Kato et al. teaches that the cyclic dimer content can be reduced through sublimation during the solid phase step (10:34-59) during which the intrinsic viscosity increases to values greater than 0.81 (10:34-59). However, Scardino et al. teaches that the devolatilization can occur in the melt phase rather than the solid phase (¶0015). Therefore the rejection involves substituting the solid phase

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devolitization step of Kato et al. with the melt phase devolitization of Scardino et al. Additionally, as Kelsey et al. (US 2002/0009353), which is incorporated in Scardino et al. (¶0015), suggests that the all melt process of Scardino et al. improves the dyeability of the resin (¶0006), and Kato et al. is concerned with improving the dyeability of their resin (10:7-12), a person having ordinary skill in the art at the time of invention would have been motivated to have used the method of Scardino.

C) Applicants argument that the references do not teach a cyclic dimer content of less than 1.5% is not persuasive. Kato et al. teaches that cyclic dimer contents as low as less than 1% by weight through the use of devolitalization (10:34-59). This is due to the choice of catalyst (9:66-10:6).

In the Advisory action dated 4/7/09 newly added claims 9 and 10 were not addressed as they are substantially the same as previous claims 5 and 6. As no arguments were presented in response to previous rejection of claims 5 and 6, no arguments could be addressed with respect to claims 9 and 10.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/

Supervisory Patent Examiner, Art Unit 1796

LJH

June 23, 2009